

Introduction

Scientific breakthroughs and technological innovations in the 20th century fueled substantial gains in agricultural productivity in many countries. The development of new technologies and practices resulted from both public and private investments in research. Countries that enjoyed high agricultural productivity growth were able to increase incomes, participate in global markets, reduce hunger, and improve the quality of life of their citizens. For the countries that were not able to benefit from the advances in science and technology, agricultural productivity did not grow quickly. This resulted in unmet needs for income growth and food security—defined as access by all people at all times to sufficient nutritious food for active, healthy lives.

With supportive policy, regulatory, and institutional frameworks in place, science and technology can increase agricultural productivity and stimulate economic

growth in all countries, thus reducing chronic hunger and offering more opportunities for participation in global markets.

Expanded global trade, investment, and economic integration could expand market opportunities for developing and developed economies alike. The potential benefits of international trade and technological progress are enormous. Integrated capital markets and the free flow of information create opportunities for growth and can have a significant impact on reducing poverty and hunger.

Industrialized nations, including the United States, have made a commitment to increase the opportunities for all countries to participate in the global economy. One way is to help developing countries strengthen their capacity to conduct research, develop regulations, and create the economic and institutional environment to facilitate the transfer of science and technologies appropriate to each country's unique needs. Investments made



through public/private partnerships and between countries can have a great long-term payoff for all participants.

Section I of this report, “Agricultural Productivity: An Engine of Development,” describes how scientific and technological investments have resulted in agricultural productivity gains for developed countries, and for those developing countries that benefited most from the Green Revolution that began in the last half of the 20th century.

Many technologies and practices developed in the 20th century, and those that will be developed in the 21st century, could be adapted to meet the unique needs of each developing country. Scientific understanding about the interactions between agricultural production and ecosystem health can also contribute to the development of a sustainable agricultural system. The choice of an appropriate set of technologies and practices should incorporate indigenous knowledge

of the local economic, social, and natural resource environment. Section II, “Potential Benefits of Science and Technology,” describes these production and postharvest technologies, along with promising new scientific fields that may lead to innovations in the future.

The development and transfer of science and agricultural technologies will be most successful if current impediments and barriers are reduced. Lack of infrastructure, poor natural resource endowments, and restrictive international policies can all hinder technology development, transfer, and adaptation. These impediments can also hinder farmers from adopting sustainable agricultural practices. Section III, “Support for Technology Development and Transfer,” discusses economic, financial, and policy infrastructure and presents examples of barriers to the development and transfer of the newest science, such as intellectual property rights restrictions. It also includes exam-

ples of public and private partnerships that can increase the capacity of developing countries to create and implement a science and technology program consistent with their sustainable agricultural goals and based on their unique environmental, social, and economic conditions. When countries can make choices based on sound science and accurate information, the chances of attaining their individual national goals are high.

The challenges and opportunities for increasing sustainable agricultural productivity are described in Section IV. Public and private partnerships can increase the possibilities for countries to have access to scientific and technological advances. Indigenous development of technologies and transfer of innovations will be enhanced when barriers to investment are lowered.



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